

AMENDMENTS TO THE CLAIMS

This listing of the claims replaces all prior listings and versions:

1. (withdrawn) An isolated, non-canonical zinc finger binding protein encoded by the polynucleotide of claim 30.
2. (previously presented) The isolated polynucleotide of claim 30, wherein the target sequence is a nucleic acid sequence.
3. (withdrawn) The isolated polynucleotide of claim 30, wherein the target sequence is an amino acid sequence.
4. (previously presented) The isolated polynucleotide of claim 2, wherein the target sequence is DNA.
5. (withdrawn) The isolated polynucleotide of claim 2, wherein the target sequence is RNA.
- 6-21. (canceled)
22. (previously presented) The isolated polynucleotide of claim 30, wherein the target sequence is in a plant cell.
23. (withdrawn) The isolated polynucleotide of claim 30, wherein the target sequence is in an animal cell.
24. (withdrawn) The isolated polynucleotide of claim 23, wherein the target sequence is in a human cell.
25. (previously presented) The isolated polynucleotide of claim 30, wherein the target sequence is a promoter sequence.
26. (currently amended) The isolated polynucleotide of claim 30, wherein the zinc finger binding protein comprises ~~comprising~~ three zinc finger components.

27. (previously presented) The isolated polynucleotide of claim 30, wherein the target sequence comprises about 9 to about 14 contiguous base pairs.

28. (previously presented) The isolated polynucleotide of claim 26, wherein the third zinc finger component comprises a non-canonical zinc finger component.

29. (cancelled)

30. (currently amended) An isolated polynucleotide encoding a non-naturally-occurring zinc-finger binding protein comprising a non-canonical zinc finger component, wherein:

(i) said non-canonical zinc finger component contains a beta turn comprising ~~the~~ two amino-terminal zinc coordinating cysteine or histidine residues and an alpha helix comprising ~~the~~ two carboxy-terminal zinc coordinating cysteine or histidine residues, ~~and wherein at least one of the amino-terminal zinc coordinating residues is a histidine residue, or at least one of the carboxy-terminal zinc coordinating residues is a cysteine residue;~~ and

~~(ii) the zinc-coordinating residues of said non-canonical zinc finger component do not consist of two cysteine residues and two histidine residues;~~

~~wherein (ii) the protein is engineered to bind to a target sequence.~~

31. (original) An expression vector comprising the polynucleotide of claim 30.

32. (original) A host cell comprising the polynucleotide of claim 30.

33. (withdrawn) A fusion polypeptide comprising: (a) an isolated zinc finger binding protein according to claim 1 and (b) at least one functional domain.

34. (withdrawn) The polynucleotide of claim 39, wherein the functional domain is a repressive domain.

35. (withdrawn) The polynucleotide of claim 34, wherein the repressive domain is selected from the group consisting of KRAB, MBD-2B, v-ErbA, MBD3, TR and members of the DNMT family.

36. (previously presented) The polynucleotide of claim 39, wherein the functional domain is an activation domain.

37. (previously presented) The polynucleotide of claim 36, wherein the activation domain is selected from the group consisting of maize C1, VP16, p53 subunit of NF-kappa B, and VP64.

38. (withdrawn) The polynucleotide of claim 39, wherein the functional domain is an endonuclease.

39. (previously presented) An isolated polynucleotide according to claim 30 further encoding a functional domain.

40. (original) An expression vector comprising the polynucleotide of claim 39.

41. (original) A host cell comprising the polynucleotide of claim 39.

42. (withdrawn) A method of modulating expression of a gene, the method comprising the step of contacting a cell with a polynucleotide according to claim 39.

43. (withdrawn, currently amended) The method of claim 42, wherein the zinc finger binding protein of the fusion molecule binds to a target site in a gene encoding a product selected from the group consisting of gamma-tocopherol methyl transferase (GMT), vascular endothelial growth factor, erythropoietin, androgen receptor, PPAR- γ 2, p16, p53, pRb, dystrophin and e-cadherin.

44. (withdrawn) The method of claim 42, wherein the functional domain comprises a repressive domain.

45. (withdrawn) The method of claim 44, wherein the repressive domain is selected from the group consisting of KRAB, MBD-2B, v-ErbA, MBD3, TR and members of the DNMT family.

46. (withdrawn) The method of claim 42, wherein the functional domain comprises an activation domain.

47. (withdrawn) The method of claim 46, wherein the activation domain is selected from the group consisting of maize C1, VP16, p65 subunit of NF-kappa B, and VP64.

48. (withdrawn) The method of claim 42, wherein the functional domain is an endonuclease.

49. (withdrawn) The method of claim 42, wherein the gene is in a plant cell.

50. (withdrawn) The method of claim 42, wherein the gene is in an animal cell.

51. (withdrawn) The method of claim 50, wherein the gene is in a human cell.

52. (withdrawn) A pharmaceutical composition comprising a non-naturally-occurring zinc-finger binding protein according to claim 1 and a pharmaceutically acceptable excipient.

53. (previously presented) A pharmaceutical composition comprising a polynucleotide according to claim 39 and a pharmaceutically acceptable excipient.

54. (new) The isolated polynucleotide of claim 26, wherein the first zinc finger component comprises a non-canonical zinc finger component.

55. (new) The isolated polynucleotide of claim 30, wherein the zinc finger binding protein comprises four zinc finger components.